UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2004/00504

July 22, 2004

Mr. Lawrence C. Evans
U.S. Army Corps of Engineers
Attn: Karla Ellis
Portland District, CENWP-CO-GP
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Conference, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the 242nd Ave Fish Passage Improvement Project by Clackamas County, Johnson Creek, Clackamas County, Oregon (Corps No. 200400164)

Dear Mr. Evans:

Enclosed is a biological and conference opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) for the issuance of a permit to Clackamas County under section 404 of the Clean Water Act to authorize a fish passage improvement project in Johnson Creek. The Corps of Engineers (COE) determined that the action is likely to adversely affect Lower Columbia River (LCR) Chinook salmon (*Oncorhynchus tshawytscha*), LCR steelhead (*O. mykiss*), and LCR coho (*O. kisutch)*. NOAA Fisheries concludes in this Opinion that the proposed action is not likely to jeopardize the continued existence of LCR Chinook salmon, LCR steelhead, or LCR coho.

Pursuant to section 7 of the ESA, NOAA Fisheries included reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are necessary and appropriate to minimize the potential for incidental take associated with this project.

In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of LCR coho salmon, which are proposed for listing as threatened under the Endangered Species Act. As required by section 7 of the ESA, NOAA Fisheries included an incidental take statement with reasonable and prudent measures and nondiscretionary terms and conditions that are necessary to minimize the impact of incidental take associated with this action. However, the incidental take statement does not become effective until NOAA Fisheries adopts this conference opinion as a biological opinion, after the listing is final. Until the time that the species is listed, the prohibitions of the ESA do not apply.

This document also serves as consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and its implementing regulations (50 CFR Part 600). NOAA Fisheries concludes that the proposed action will adversely affect designated EFH for coho salmon and Chinook salmon. As required by section 305(b)(4)(A) of the MSA, conservation recommendations are included that NOAA Fisheries believes will avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed consultation, 305(b)(4)(B) of the MSA requires that a Federal action agency must provide a detailed response in writing within 30 days after receiving an EFH conservation recommendation.

Questions regarding this letter should be directed to Christy Fellas, fisheries biologist in the Willamette Basin Habitat Branch of the Oregon State Habitat Office at 503.231.2307.

Sincerely,

D. Robert Lohn
Regional Administrator

cc: Mark Mouser, Clackamas County

Endangered Species Act - Section 7 Consultation
Biological Opinion and Conference Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

242nd Ave Passage Improvement Project by Clackamas County,
Johnson Creek, Clackamas County, Oregon
(Corps No. 200400164)

Agency:	U.S. Army Corps of Engineers
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	July 22, 2004
Issued by:	 _____ D. Robert Lohn Regional Administrator
Refer to:	**2004/00504**

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1. INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), as amended, establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with U.S. Fish and Wildlife Service (FWS) and NOAA's National Marine Fisheries Service (NOAA Fisheries), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitats. This biological and conference opinion (Opinion) is the product of an interagency consultation and conference pursuant to section 7(a)(2) of the ESA and implementing regulations found at 50 CFR 402.

The analysis also fulfills the essential fish habitat (EFH) requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).

1.1 Background

On April 28, 2004, NOAA Fisheries received a letter from the U.S. Army Corps of Engineers (COE) requesting informal consultation pursuant to the ESA for the issuance of a permit under section 404 of the Clean Water Act to Clackamas County for a fish passage improvement project in Johnson Creek. On May 4, 2004, NOAA Fisheries determined that the action had effects that are likely to adversely affect listed species and suggested the action undergo formal consultation. The COE did not object to this determination and formal consultation was initiated on April 28, 2004.

NOAA Fisheries determined the proposed action was likely to adversely affect Lower Columbia River (LCR) Chinook salmon (*Oncorhynchus tshawytscha*) and LCR steelhead (*O. mykiss*). In addition, on June 14, 2004, LCR coho (*O. kisutch*) were recognized as proposed for listing. References and dates listing status and ESA section 4(d) take prohibitions are in Table 1.

Table 1. Federal Register Notices for Final Rules that list species, designate critical habitat, or apply protective regulations to evolutionarily significant units (ESUs) considered in this Opinion. (Listing status 'T' means listed as threatened under the ESA, 'E' means listed as endangered, and 'P' means proposed for listing; see, also, proposed listing determinations for 27 ESUs of West Coast salmonids, at 69 FR 33102, 6/14/04.)

Species ESU	Listing Status	Critical Habitat	Protective Regulations
Chinook salmon (*Oncorhynchus Tshawytscha*)			
Lower Columbia River	T 3/24/99; 64 FR 14308	Not applicable	7/10/00; 65 FR 42422
Coho salmon (*O. kisutch*)			
Lower Columbia River	P 6/14/04; 69 FR 33102	Not applicable	Not applicable
Steelhead (*O. mykiss*)			
Lower Columbia River	T 3/19/98; 63 FR 13347	Not applicable	7/10/00; 65 FR 42422

1.2 Proposed Action

There will be five main construction components to the project. They are as follows:

1. The project site will be dewatered and erosion and sedimentation controls will be installed.
2. The existing side-by-side culverts at milepost 1.96 will be removed and replaced with a 3-sided, open bottom, concrete box culvert. The stream channel entering the new culvert will be realigned to allow for an improved stream flow into the culvert.
3. The existing culverts (*i.e.*, beside each other) at milepost 2.02 will be replaced with a 3-sided, concrete box culvert. The stream channel entering the new culvert will be realigned to allow for an improved stream flow into the culvert.
4. A new, meandering stream channel will be constructed downstream from the new culvert at milepost 2.02.
5. The existing 20-inch high-pressure natural gas pipeline buried under 242nd Avenue will be excavated and lowered to accommodate the new culvert installations at mileposts 1.96 and 2.02.

Project-Related Responsibilities

Clackamas County, Williams Northwest Pipeline Corporation (WNPC), and Oregon Department of Fish and Wildlife (ODFW) will complete all project work. WNPC will hire a construction contractor to lower the gas pipeline as specified by WNPC contracts. Work is proposed to be completed between July 15 and August 15, 2004. All in-water work will occur during the

Oregon in-water work period (*i.e.*, July 15 and August 31). Primary project responsibilities for each of these parties are as follows:

Clackamas County's primary responsibilities will include:

- Coordinating the removal/reinforcement of the Pacific Gas and Electric power pole near the culvert inlet at milepost 2.02.
- Road closures of 242nd Avenue and Sunshine Valley Road, including erection of all necessary signage and barriers.
- Dewatering the work areas at the two culvert locations and installing appropriate erosion and sediment controls (to be maintained by the WNPC Contractor).
- Excavation as required, and installation of the new culverts once the relocated natural gas pipeline has been backfilled.
- Realignment and construction of the stream channels at the project site. Backfilling and paving 242nd Avenue and Sunshine Valley Road as required.
- Properly disposing of any excess fill materials at a reclamation site at a county quarry near Barton, Oregon.
- Stabilization and revegetation of the project site at the end of construction activities.
- Initiating stream flows on culvert installations and the completion of stream channel work.

WNPC Contractor's primary responsibilities will include:

- Preparation of an on-site pipe yard/staging area, including the installation of silt and safety fences in this area.
- Mobilization of all labor, supervision, materials, and equipment to the job site.
- Fabrication of the required replacement pipe sections.
- Hydrostatic testing, including the transportation of water from the source location to the job site.
- Installation and removal of sheet piles as required.
- Assisting with the installation of a stopple fitting at pipeline milepost 14.18.
- Erection and removal of engineered noise abatement walls at the Southeast Portland Meter Station.
- Assisting with removing from service the high pressure natural gas pipeline to be lowered.
- Excavation and removal of the old, existing culverts.
- Excavation and replacement of the pipeline as specified in the drawings.
- Backfilling and compacting the excavated areas as required by Clackamas County.
- Providing assistance, as required, in returning the line to service.
- Transportation of surplus materials to the Oregon City Compressor Station.
- Providing all labor and equipment necessary for project execution in accordance with WNPC'sspecifications and standards.

- Providing all permits necessary for construction operations and assure that all work efforts are in compliance with project permits, environmental requirements, specifications, and standards.
- Providing a safety plan and conducting all construction operations in accordance with the plan.
- Providing all necessary training for contractor employees for compliance with safety, health, and environmental requirements.
- Cleanup and seeding disturbed areas in accordance with company specifications, permit requirements, and landowner stipulations.
- Demobilization of all labor, supervision, materials, and equipment from the job site.

ODFW's primary responsibilities will include:

- Installing or supervising the installation of fish seine nets upstream of the two unnamed tributaries that enter the culverts at mileposts 1.96 and 2.02.
- Removing fish and other aquatic wildlife species from the work areas.
- Ensuring seine nets are maintained at the project site until construction activities are completed and stream flows are reestablished at the site.

Work and Staging Areas

Before construction, WNPC will conduct safety and environmental training for all construction personnel participating in the project. WNPC will also have a dedicated chief inspector and environmental inspector employed during project construction.

From July 12 to 15, 2004, Clackamas County and the WNPC contractor will install erosion and sedimentation controls around all work and staging areas. Area boundaries will be flagged and silt fences will be installed to prevent any ground disturbance of critical riparian vegetation or streambanks beyond the proposed project boundaries. Safety fencing will also be erected to separate the project construction area from nearby residences. The flagging, fencing, and temporary erosion controls will remain in place until site restoration and reclamation are completed.

Extra Workspace (EWS) 1 is in approximately 3.7 acres of open field on the northeast corner of the intersection of 242nd Avenue and Sunshine Valley Road. This workspace will be used as a contractor staging area. Its use includes pipe and spoil storage, pipe fabrication and testing, equipment refueling, trench dewatering, and hydrostatic test water discharge.

EWS 1 will have a 5-foot setback from the ordinary high water mark (OHWM) of the adjacent project tributary. This setback will be lined with silt fencing to prevent the potential for any soil disturbance or surface water runoff into the stream during construction. All spoil removed from the culvert trenches will be stored at a minimum of 150 feet from the OHWM of the stream.

A shallow bar ditch exists between the eastern edge of 242nd Avenue and EWS 1. The bar ditch is typically dry during the summer months when project construction will occur. However, there

is a potential for significant amounts of rainfall during this time period in which the bar ditch could become saturated from surface water runoff. In order for construction equipment and personnel to enter and exit EWS 1, a temporary culvert and aggregate fill will need to be placed in and over the ditch. The temporary access road ditch crossing will be 20 feet wide, and depending on site conditions or unforeseen construction constraints, the location may shift to the north or south within the boundaries of EWS 1. Before placement of the culvert, geotextile fabric will be placed in the ditch to minimize disturbance and separate the native ditch soil and vegetation from the placement of the culvert and aggregate material. Once construction is complete and all equipment is removed from EWS 1, the aggregate, culvert, and geotextile fabric will be removed and the bar ditch will be reclaimed to its pre-construction condition.

EWS 2 is a 0.3 acre lot on the southeast corner of the intersection of 242nd Avenue and Sunshine Valley Road. This work area has been identified for contractor parking, equipment storage, and trench dewatering. Based on the location of the project culverts, EWS 2 was selected as the most appropriate and viable location for trench dewatering without creating unnecessary environmental or landowner impacts. All trench water removed from project site will be discharged into a dewatering structure in the upland area of EWS 2 as far away from the stream as is feasibly practical.

There are two existing ditch crossings that allow access to EWS 2. WNPC will use these access points to enter and exit EWS 2. The access points may need to be improved, widened, or relocated at the time of construction to allow for equipment mobility. In the event these two access points need to be improved or relocated, WNPC will implement the same procedures for crossing the ditch as described for EWS 1. The existing ditch crossings and bar ditches will be reclaimed to their original, pre-construction condition after construction completion.

Dewatering of Work Areas

Clackamas County will install sheet steel plugs at the upstream end of the two project tributaries to block stream flows from entering the work areas. A fish seine net will be placed 10 to 15 feet upstream of the sheet steel and electric pumps will be placed in between the sheet steel and seine nets. The pumps will be powered by an on-site diesel generator. These pumps will bypass the stream flows around the work areas through four inch plastic water lines into separate PVC pipe diffusers. The diffusers will be placed in the stream channels just downstream from the culvert work areas. A clamshell paste-filled sock will be placed inside each diffuser to remove sediments during stream bypass operations. All responsible parties, as addressed above, will monitor the system daily to ensure that water being returned to the tributaries is at the same or a higher water quality level (*i.e.*, turbidity levels) than the water upstream of the work areas. The clamshell paste socks will be replaced as needed to maintain water quality levels. This stream bypass system will operate 24 hours a day until stream flows are reestablished through the project site.

Milepost 1.96 Culvert and Stream Channel Realignment

There are two side-by-side 36-inch diameter corrugated metal culverts at milepost 1.96. The culverts will be removed and replaced with a 3-sided, open bottom concrete box culvert with inlet and outlet concrete wing walls. The new culvert, wing walls, and footers will be made from pre-cast reinforced concrete. The culvert will be 10 feet wide, 6 feet high, 35 feet long, and installed at the same slope (*i.e.*, 0.7%) as the long stream profiles of the stream. The stream was surveyed 200 feet upstream and a minimum of 380 feet downstream to obtain the stream profile. This information was used for the vertical design of the new culvert. Large boulders will be placed strategically throughout the structure, creating resting "shadows" for fish. This design will pass a 100-year event, reduce the velocities, and allow a natural streambed to form.

The stream channel at the culvert inlet will be realigned with the new culvert. The existing stream channel from the new constructed channel to the culvert inlet will be backfilled to prevent erosion from occurring to the north wing wall and roadway.

Milepost 2.02 Culvert, Stream Channel Realignment, and Stream Channel Construction

The existing culverts at milepost 2.02 are 36-inch and 48-inch corrugated metal culverts. The culverts will be removed and replaced with a single 3-sided open bottom concrete box culvert with inlet and outlet concrete wing walls. The new culvert, wing walls, and footers will be made from pre-cast reinforced concrete. The culvert will be 10 feet wide, 6 feet high, 42 feet long, and installed at the same slope (*i.e.*, 0.8%) as the long stream profiles of the stream. The stream was surveyed 200 feet upstream and a minimum of 380 feet downstream to obtain the stream profile. This information was used for the vertical design of the new culvert. Large boulders will be placed strategically throughout the structure, creating resting "shadows" for fish. This design will pass a 100-year flood event, reduce flow velocities, and allow a streambed to form.

The stream channel at the culvert inlet will be realigned with the new culvert. The existing stream channel from the new constructed channel to the culvert inlet will be backfilled to prevent erosion from occurring to the south wing wall and roadway. A portion of the area above the culvert inlet will be excavated for the stream channel during realignment activities.

The stream channel below the culvert has been channelized to a roadside ditch along Sunshine Valley Road resulting in high velocities and roadway erosion. Approximately 255 feet of linear stream channel will be constructed in the adjacent northeast pasture at a channel slope of 0.8%. The new channel will be isolated from the active stream with sheet steel plug during construction activities.

The new stream channel will be constructed as recommended by the FWS' geomorphologist. The channel will have a sinuosity of 1.3, meander wavelength of 100 to 120 feet, and curve of radius of 20 to 30 feet. These recommendations are consistent with the existing streams parameters near the project area. The channel will also be designed to have pools, riffles, and floodplain areas along its course. Both the floodplain and channel will be lined with coco mat for initial temporary stabilization after construction. The streambed will be constructed with 6-inch minus round gravels and 12-inch minus rock in the riffle areas. Large woody debris and

boulders may be added to the channel to provide fish habitat and protect the streambank on outside meanders. Stream materials used in the project will not come from an active stream source. The FWS geomorphologist and ODFW biologist will be on site during part or all of channel construction to oversee the work. The channel will be aligned and connected to the new culvert outlet before removing the sheet steel plugs to reestablish stream flow through the culvert and channel.

The end of the roadside ditch will be isolated from the project tributary with a sheet steel plug. New and excavated materials from the project site will be used to backfill the ditch. The fill will be compacted and planted with native vegetation. The sheet steel plug will be removed once work is completed on the ditch.

Lowering High Pressure Natural Gas Pipeline

The 20-inch diameter natural gas pipeline running under the culverts on 242nd Avenue (at pipeline mileposts 14.11 and 14.17) will need to be lowered to accommodate the new culvert installations. The WNPC Camas-Eugene pipeline runs down the center of the southbound lane at a depth of 6 feet. To accommodate the new culvert installations, the pipeline will have to be lowered approximately 5 feet at both locations. A trench 30 feet long, 7 feet wide, and 12 feet deep will be excavated at milepost 1.96. The excavated trench at milepost 2.02 will be 40 feet long, 7 feet wide, and 13 feet deep. Approximately 270 cubic yards of soil will be displaced in the work taking place at the 1.96 milepost culvert, and 400 cubic yards at the 2.02 milepost culvert. It is proposed that the work at the 1.96 milepost culvert will precede the work at the other culvert.

Before new pipe installation, the prefabricated pieces will be hydro-tested with water for a minimum of 8 hours at 1000 pounds/square inch as specified in the WNPC Gas Pipeline Strength Test Approval Form. The replacement pipe will arrive at the project site directly from the pipe mill from where it is made. There will be no hydrocarbons or rust constituents associated with the new pipe. Test water will be slowly drained into an energy dissipation structure 150 feet from either tributary. Approximately 1,865 gallons of test water will be obtained from a municipal source.

1.3 Action Area

The action area is defined by NOAA Fisheries regulations (50 CFR 402) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." Therefore, the action area for this project is Johnson Creek, including the streambed, streambank, and water column, and 300 feet upstream and downstream from the construction area.

2. ENDANGERED SPECIES ACT

2.1 Biological and Conference Opinion

The objective of this Opinion is to determine whether the proposed action is likely to jeopardize the continued existence of these ESA-listed species for these species or destroy or adversely modify designated critical habitat. This consultation and conference is conducted pursuant to section 7(a)(2) of the ESA and its implementing regulations, 50 CFR 402.

2.1.1 Biological Information

According to a recent draft of "Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead," drafted by the West Coast Salmon Biological Review Team (BRT), a number of ESUs are "likely to become endangered in the foreseeable future"(NOAA Fisheries 2003). Preliminary conclusions for each listed ESU considered in this Opinion are discussed below.

LCR Chinook

Natural-origin fish had parents that spawned in the wild as opposed to hatchery-origin fish whose parents were spawned in a hatchery. The abundance of natural-origin spawners ranges from completely extirpated for most of the spring-run populations, to over 6,500 for the Lewis River bright population. The majority of the fall-run tule populations have a substantial fraction of hatchery-origin spawners in the spawning areas and are hypothesized to be sustained largely by hatchery production. Exceptions are the Coweeman and Sandy River fall-run populations which have few hatchery fish spawning on the natural spawning areas. These populations have recent mean abundance estimates of 348 and 183 spawners, respectively. The majority of the spring-run populations have been extirpated largely as the result of dams blocking access to their high elevation habitat. The two bright Chinook populations (*i.e.* Lewis and Sandy) have relatively high abundances, particularly the Lewis.

In many cases, data were not available to distinguish between natural- and hatchery-origin spawners, so only total spawner (or dam count) information is presented. This type of figure can give a sense of the levels of abundance, overall trend, patterns of variability, and the fraction of hatchery-origin spawners. A high fraction of hatchery-origin spawners indicates that the population may potentially be sustained by hatchery production and not the natural environment. It is important to note that estimates of the fraction of hatchery-origin fish are highly uncertain since the hatchery marking rate for LCR fall Chinook is generally only a few percent and expansion to population hatchery fraction is based on only a handful of recovered marked fish.

LCR Steelhead

Based on the updated information provided in this report, the information contained in previous LCR status reviews, and preliminary analyses, the number of historical and currently viable populations have been tentatively identified. This summary indicates some of the uncertainty about this ESU. Like the previous BRT, the current BRT could not conclusively

identify a single population that is naturally self-sustaining. Over the period of the available time series, most of the populations are in decline and are at relatively low abundance (no population has recent mean greater than 750 spawners). In addition, many of the populations continue to have a substantial fraction of hatchery-origin spawners and may not be naturally self-sustaining.

LCR Coho

The status of this ESU was reviewed by the BRT only a year ago, so relatively little new information was available. A majority of the likelihood votes for LCR coho fell in the "danger of extinction" category, with the remainder falling in the "likely to become endangered" category. As indicated by the risk matrix totals, the BRT had major concerns for this ESU in all risk categories (mean scores ranged from 4.3 for growth rate/productivity to 4.8 for spatial structure/connectivity). The most serious overall concern was the nearly total absence of naturally-produced spawners throughout the ESU, with attendant risks associated with small population, loss of diversity, and fragmentation and isolation of the remaining naturally-produced fish. In the only two populations with significant natural production (Sandy and Clackamas), short- and long-term trends are negative and productivity (as gauged by preharvest recruits) is down sharply from recent (1980s) levels. On the positive side, adult returns in 2000 and 2001 were up noticeably in some areas.

The paucity of naturally-produced spawners in this ESU can be contrasted with the very large number of hatchery-produced adults. Although the scale of the hatchery programs, and the great disparity in relative numbers of hatchery and wild fish, produce many genetic and ecological threats to the natural populations, collectively these hatchery populations contain a great deal of genetic resources that might be tapped to help promote restoration of more widespread naturally-spawning populations.

2.1.2 Evaluating Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402. In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps: (1) Consider the status and biological requirements of the species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species; (4) consider cumulative effects; and (5) determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of species survival in the wild or adversely modify its critical habitat. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with all cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species or result in the destruction or adverse modification of critical habitat. If either or both are found, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

2.1.3 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmonids is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the status of the listed species, taking into account population size, trends, distribution, and genetic diversity. To assess the status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for the listed species to survive and recover to a naturally-reproducing population level, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For this consultation and conference, the biological requirements are improved habitat characteristics that function to support successful rearing and migration. The status of the listed species, based on their risk of extinction, has not significantly improved since the species were listed.

2.1.4 Environmental Baseline

The most recent evaluation of the environmental baseline for Johnson Creek is in the Johnson Creek Watershed Assessment and Action Plan (JCWC, 2004). The baseline is summarized below. For a detailed evaluation of the environmental baseline in Johnson Creek, see the watershed assessment at www.jcwc.org.

On the east side of the greater Portland metropolitan region, Johnson Creek originates in Clackamas County, east of Boring, Oregon, and flows westward approximately 25 miles to its confluence with the Willamette River. The Johnson Creek drainage basin encompasses approximately 34,000 acres, or about 54 square miles. The mostly urban watershed is contained within six local jurisdictional entities including Clackamas and Multnomah Counties, and the cities of Gresham, Happy Valley, Milwaukie, and Portland. A recent City of Portland assessment of the watershed divided the basin into reaches defined as the mainstem Johnson Creek (lower, middle, and upper); and the following major tributaries: Crystal Springs Creek, Kelley Creek, Butler Creek, Hogan Creek, Sunshine Creek, and Badger Creek. In addition, Minthorn or Spring Creek discharges into Johnson Creek within the city of Milwaukie.

Elevations in the watershed generally range between 0 to 1,100 feet above mean sea level. Slopes are highly variable and range generally between 1 to 25%. Soils in the watershed are primarily Multnomah and Latourell-Urban Land Complex (Type B hydrologic group) or Cascade Silt Loam (Type C hydrologic group).

The Johnson Creek watershed is highly developed. A mix of land use is present, varying from heavily developed urban areas in the lower and middle reaches of the watershed to rural residential and agricultural in the upper watershed. Current land use (2003) in the basin reveals single family residential makes up the largest acreage and percentage at approximately 13,400 acres or 39%.

In the agricultural areas of the upper watershed, 50% of the land base is used for cultivated crops or pastures, and another 29% is used for tree and ornamental plant nurseries, greenhouses, or Christmas tree plantations (Reininga and Davis, 1994). The Springwater Corridor Trail is a key recreational facility in the watershed, extending more than 16 miles and occupying a former railroad right-of-way paralleling Johnson Creek for much of its length.

The urban growth boundary (UGB) for the Portland metropolitan region passes through the Johnson Creek watershed. About 72% (approximately 24,000 acres) of the watershed's 34,000 acres lies within the UGB (Meross, 2000). Approximately 170,000 residents reside within the watershed. In 1997, Metro approved the 2040 Regional Growth Plan that will accommodate a population increase of 1.1 million new residents in the region by 2040. Comprehensive planning is underway in Pleasant Valley, the Springwater area east of Gresham, and the Damascus area to the south.

Much of the two lower sections of Johnson Creek (15 miles) are deeply channelized and confined. Most of the channelization, designed to control flooding, is the product of depression-era public works agencies, primarily the Civil Works Administration and the Works Projects Administration. At several locations along the stream, a new course was created and the stream channel was straightened, deepened, and simplified. Dikes were constructed to contain and control the stream at high flow. Beginning in 1933, streamside vegetation was removed, and the dikes and streambed were armored with basalt rocks.

Flow and Hydrology

Johnson Creek is a low gradient stream that drops approximately 700 feet over its course. The average gradient along the mainstem is 0.5%. Land uses, piping of flow, and the addition of impervious surfaces highly impact flow patterns in the watershed. General hydrologic patterns in Johnson Creek are driven by patterns of rainfall and groundwater inflow. High flows normally occur in December, January, and February in response to abundant precipitation and high amounts of runoff as soils become saturated through the rainy season. Summer low flows in July, August, and September reflect minimal groundwater contributions to stream flow throughout the watershed. A 1984 study of the effects of development and resultant impervious surfaces on peak flows in Johnson Creek (Clement, 1984) concluded that for a storm of a given size the peak flow under 1980 conditions was 30% greater than under 1940 conditions. However, peak flow frequency at the Sycamore stream flow gauge (River Mile 10.2) shows no discernable upward trend over the last 60 years.

Bankfull discharges at the Sycamore gauge are around 867 cubic feet-per-second (cfs) and occur about 3 times per year. Flood stage is reached at a flow of around 1,080 cfs, which occurs on

average about 1.8 times per year. Major floods correspond to flows of 1,650 cfs, which has occurred about once every 3 to 4 years. Flooding events primarily affect four areas within Portland: (1) Tideman-Johnson Park at SE 45th; (2) the area west of SE 82nd; (3) the Lents area; and (4) lower Powell Butte.

Johnson Creek suffers from a low baseflow during the late spring/early summer through early fall season. Some of the tributaries dry up during the summer periods and the velocity and volume of baseflows in the main stem Johnson Creek become minimal. The ODFW set minimum flow targets to protect salmonids in Johnson Creek (Meross, 2000). Flows in the middle and upper watershed frequently do not meet those minimum flows, particularly in spring and summer months. Below spring-fed Crystal Springs, which provides consistent and abundant year-round flow, minimum instream flows are typically met.

The Portland ESA Program assessed baseline conditions for flow and hydrology indicators in Johnson Creek. The following indictors were rated as not properly functioning: hydrograph, hydrologic sources, and floodplain presence and connectivity. The impervious surfaces indicator was rated as at-risk. These indicators and their assessed baseline condition compared to properly functioning conditions were incorporated into an Ecosystem Diagnosis & Treatment (EDT) model.

Physical Habitats

The Johnson Creek watershed contains a mosaic of vegetation types, including agricultural lands, urban and suburban landscapes, upland forests, riparian woodlands, and wetlands. Remnants of pre-development vegetation are rare, as a result of extensive logging and clearing (Portland Bureau of Planning 2001). Upland habitat, the forest that historically covered the Johnson Creek watershed ridges and lowlands, was mostly cleared in the early 1900s for agriculture, timber production, and urban uses. Forest clearing of second growth increased dramatically in recent years as housing development expanded from the lowlands onto the ridges and hillside slopes. Presently, about 57% of the watershed is vegetated (City of Portland 2001). The Johnson Creek watershed straddles the border between the Willamette Valley vegetation zone and the Western Hemlock zone. The upland forest community exhibits characteristics common to both zones. The Boring Lava Domes area is more heavily forested than most of the watershed.

Riparian Areas

The riparian corridor along Johnson Creek and its tributaries varies in width, from extensive vegetated areas over 600 feet in width to reaches with little or no vegetation along the bank. The most extensive vegetated riparian areas in the drainage basin are in smaller headwater creeks in the Boring Hills south of Powell Butte on either side of the Gresham/Portland urban services boundary (Portland Bureau of Planning, 2001). On the mainstem, reaches 12 and 16, and parts of 13 and 14, have the largest forested riparian areas. The tributaries with the most heavily forested riparian areas are Mitchell, Badger, Sunshine, and Deardorf/Wahoo Creeks. Crystal Springs and the lower reaches of Johnson Creek (near the Milwaukie/Portland boundary) have the least extensive riparian vegetation. The headwater streams flowing through rural and

agricultural lands in the upper watershed have very little riparian vegetation. Riparian areas within the Johnson Creek watershed consist primarily of mixed forest with some coniferous forest and shrub areas. Riparian vegetation is either narrow, minimal or lacking throughout much of the watershed. Generally, existing riparian vegetation consists of areas dominated by blackberry or young native plants and lack large mature trees.

Instream Habitat

The channelization of Johnson Creek has had a significant impact on the quality of instream physical habitat. Because the historic floodplain of Johnson Creek is disconnected or minimally connected through much of its length, flood flows cannot spread out and attenuate on the floodplain. The ODFW conducted aquatic habitat inventories throughout Johnson Creek during 1999 to 2000. The ODFW findings generally indicate that Johnson Creek has extremely low wood volumes instream, particularly large wood necessary for pool formation. This is due to a lack of large, mature riparian trees and active removal of wood debris from the creek by citizens and staff from city agencies trying to prevent obstruction of flows downstream (McConnaha, 2002). ODFW also found a high percentage of hardened banks, lack of refugia through many reaches, channel incision, and high levels of fine sediment. ODFW found that glides, which are generally uncommon in natural, healthy creeks, are widespread throughout the creek. This is an indication of the quality of instream habitat, and is likely due to the deficiency of instream wood; a key element in breaking glides into pools and riffles.

The habitat assessment of Kelley Creek reveals that there are a few small sections of higher quality habitat, while much of the creek is impacted or degraded. Most impacts are due to the lack of high quality riparian habitat and large quantity of stormwater draining the creek as a result of tiling and other agricultural practices (ODFW 2000; BES 2001). Crystal Springs Creek habitat is degraded as well. Much of the creek has been channelized and lacks healthy riparian buffers.

The Portland ESA Program assessed baseline conditions for habitat indicators in Johnson Creek. These indicators and their associated baseline conditions were then compared to properly functioning conditions. The following habitat indicators were rated as not properly functioning: Floodplain quality, riparian integrity, channel substrate, off-channel habitat, large wood, shoreline complexity, and fish passage/access. Habitat attributes that were rated at risk included depth refugia, and harassment. These habitat attributes were incorporated into an EDT model.

Water Quality

Numerous water quality studies have been conducted throughout the Johnson Creek watershed. The Oregon Department of Environmental Quality (DEQ) rates Johnson Creek water quality as poor. DEQ has been monitoring Johnson Creek at SE 17th Avenue since 1990, and the agency rates Johnson Creek water quality as poor. At this location, Johnson Creek is impacted by very high concentrations of nitrate-nitrogen and high concentrations of total phosphates, fecal coliform bacteria, total solids, and biochemical oxygen demand. The Cities of Portland and Gresham, the United States Geological Survey (USGS), and Clackamas Water Environment Services (WES) have collected data on water quality in Johnson Creek.

Fish Communities

As part of the Lower Columbia River ESU, steelhead and Chinook salmon are listed as threatened in Johnson Creek under the ESA. The City of Portland in 1992, and ODFW in 1993, conducted surveys of the fish community in Johnson Creek. The fish community is dominated by species tolerant of warm water and disturbed conditions, particularly redside shiners, reticulate sculpin, and speckled dace (McConnaha 2002; JCCC 1995). Large-scale suckers are abundant in the lower reaches.

Johnson Creek historically had large salmon populations. Numbers declined dramatically once urbanization began and particularly after the channelization work was completed (McConnaha, 2002). However, adult salmonids have been observed in recent years, including oho salmon, Chinook salmon, cutthroat trout, and steelhead (ODFW unpublished data, as cited in Portland BES, 1999). Coastal subspecies of cutthroat trout are also present in Johnson Creek. This coastal subspecies has both sea-run and resident forms.

In 2001, ODFW and the City of Portland's ESA program began a project to inventory fish communities within Johnson Creek to determine salmonid presence, life history, and habitat usage throughout the watershed (Graham and Ward, 2002). Fish surveys were conducted in eight Portland streams including Crystal Springs, Johnson, and Kelley Creeks. Johnson Creek had the highest number of families including salmonids, lamprey, cottids, cyprinids, and centrarchids. Johnson Creek had both cutthroat trout and rainbow/steelhead. Coho salmon were only found in Johnson Creek. Lampreys were limited to reaches 8, 14, and 16 within Johnson Creek. Lampreys were most abundant in Kelley Creek. A total of 131 non-native fish were collected and identified, all from the lowest reach of each stream (Graham and Ward, 2002).

2.1.5 Analysis of Effects

Effects of the Proposed Action

Potential effects of the proposed action on listed salmonids include: (1) Potential for direct take, harm or disturbance during in-water work; and (2) an increase in turbidity from construction. Long-term benefits are expected from the restoration and channel creation.

Turbidity from Construction

The effects of suspended sediment and turbidity on fish, as reported in the literature, range from beneficial to detrimental. Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorus fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the frequency and the duration of the exposure, not just the TSS concentration.

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980; Birtwell *et al.* 1984; Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (Sigler *et al.* 1984; Lloyd 1987; Scannell 1988; Servizi and Martens 1991). Juvenile salmonids avoid streams that are

chronically turbid, such as glacial streams or those disturbed by human activities, unless the fish need to traverse these streams along migration routes (Lloyd 1987).

Turbidity from the proposed project is expected to be minor and limited in space and time. Isolating the work area during culvert replacement and stream channel reconstruction, along with slowly rewatering the channel and the proposed construction best management practices will minimize any generation of turbidity. Consequently, turbidity from the proposed project is not expected to have significant impacts on salmonids in Johnson Creek.

Work Area Isolation

The most lethal biological effects of the proposed actions on individual listed salmon and steelhead will likely be caused by the isolation of in-water areas. Although work area isolation is itself a conservation measure intended to reduce the adverse effects of erosion and runoff on the population, any individual fish present in the work isolation area will be captured and released. Capturing and handling fish causes them stress though they typically recover fairly rapidly from the process and therefore the overall effects of the procedure are generally short-lived (NMFS 2002a). The primary contributing factors to stress and death from handling are differences in water temperatures (between the river and wherever the fish are held), dissolved oxygen conditions, the amount of time that fish are held out of the water, and physical trauma. Stress on salmonids increases rapidly from handling if the water temperature exceeds 18°C or dissolved oxygen is below saturation. Fish that are transferred to holding tanks can experience trauma if care is not taken in the transfer process, and fish can experience stress and injury from overcrowding in traps, if the traps are not emptied on a regular basis. Debris buildup at traps can also kill or injure fish if the traps are not monitored and cleared on a regular basis.

These biological effects will be minimized or avoiding by the following conservation measures:

- Work within the active channel will be completed during preferred in-water work windows, when ESA listed fish are least likely to be present in the action area, unless otherwise approved in writing by NOAA Fisheries.
- Fish passage will be provided for any adult or juvenile salmonid species that may be present in the project area during construction, and after construction for the life of the project.
- If ESA listed fish are present, or the work area is within 300 feet of a spawning area, the in-water work area will be isolated.
- Any water intakes used for the project – including pumps used to dewater the work isolation area – will have a fish screen installed, operated and maintained according to NOAA Fisheries' fish screen criteria.
- Any listed fish that may be trapped within the isolated work area will be captured and released using methods approved by NOAA Fisheries, including supervision by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish.

Long-Term Beneficial Effects

The constructed channels at miles 1.96 and 2.02 will convert a roadside ditch to a meandering, more natural, stream. The addition of native vegetation will improve habitat conditions including microclimate (light, temperature, humidity), contribution of organic matter and woody debris to the channel and resistance to erosion through root strength (Gregory *et al.* 1991). Degree of shading of streams is a function of the structure and composition of riparian vegetation (Gregory *et al.* 1991). As the vegetation matures over time, it will contribute to the improvement of habitat functions. Boulders will be incorporated into the new channel to provide cover and create resting places for fish

There are no adverse effects to salmonids from the planting of riparian vegetation. The new channel is expected to provide cover, refugia and more functional habitat, increasing in value over time.

2.1.6 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as those effects of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being (or have been) reviewed through separate section 7 consultation processes. Therefore, these actions are not considered cumulative to the proposed action.

NOAA Fisheries is not aware of any specific future non-federal activities within the action area that would cause greater effects to listed species than presently occurs. Between 1990 and 2000, the population of Clackamas County increased by 21.4%.[1] Thus, NOAA Fisheries assumes that future private and state actions will continue within the action area, increasing as population density rises. As the human population in the state continues to grow, demand for actions similar to the subject project likely will continue to increase as well. Each subsequent action may have only a small incremental effect, but taken together they may have a significant effect that would further degrade the watershed's environmental baseline and undermine the improvements in habitat conditions necessary for listed species to survive and recover.

2.1.7 Conclusion

NOAA Fisheries has determined that, based on the available information, the proposed action is not likely to jeopardize the continued existence of listed species. NOAA Fisheries used the best available scientific and commercial data to analyze the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects.

[1] U.S. Census Bureau, State and County Quickfacts, Columbia County, Oregon. Available at http://quickfacts.census.gov/qfd/states/41/41009.html

These conclusions are based on the following considerations: (1) The work will be completed in the recommended in-water work window; (2) any increases in sedimentation and turbidity in the project area will be minor, local, and short-term; (3) new culverts will provide better passage for listed species; (4) the restored channel will provide beneficial habitat; and (5) the proposed action is not likely to impair properly functioning habitat, or retard the long-term progress of impaired habitat toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.1.8 Reinitiation of Consultation

Consultation must be reinitiated if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

2.2 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 222.102] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

An incidental take statement specifies the impact of any incidental taking of listed species. It also provides reasonable and prudent measures that are necessary to minimize the effects of take and sets forth non-discretionary terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

However, the incidental take statement included in this conference opinion for LCR coho does not become effective until NOAA Fisheries adopts the conference opinion as a biological opinion, after the listing is final. Until the time that the species is listed, the prohibitions of the ESA do not apply.

2.2.1 Amount or Extent of the Take

NOAA Fisheries expects that construction activities, work area isolation, and fish salvage may cause incidental take of up to 10 juveniles each of Chinook salmon, and steelhead, and potentially result in mortality of up to five juveniles of each. The amount of incidental take associated with other parts of the action covered by this Opinion is unquantifiable in the short term, and is not expected to be measurable as long-term effects on habitat or population levels.

The extent of the take is limited to disturbance resulting from construction activities within the action area. The action area is Johnson Creek, including the streambed, streambank, and water column, and 300 feet upstream and downstream from the construction area.

2.2.2 Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions in order for the exemption in section 7(a)(2) to apply. The COE has the continuing duty to regulate the activities covered in this incidental take statement. If the COE fails to adhere to the terms and conditions of the incidental take statement through enforceable terms added to the document authorizing this action, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(a)(2) may lapse.

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to avoid or minimize take of listed salmonid species resulting from the action covered by this Opinion.

The COE shall include measures that will:

1. Complete a comprehensive monitoring and reporting program to ensure implementation of these conservation measures are effective at minimizing the likelihood of take from permitted activities.

2. Avoid or minimize incidental take from construction activities by excluding unauthorized permit actions and applying permit conditions or project specifications that avoid or minimize adverse effects to riparian and aquatic systems.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the COE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity.

1. To implement reasonable and prudent measure #1 (monitoring), the COE shall:

   a. Implementation monitoring. Ensure that the applicant submits a monitoring report. Each project level monitoring report will include the following information, submitted to NOAA Fisheries and the COE annually, by December 31.
      i. Project identification
         (1) Applicant name, permit number, and project name.
         (2) Type of activity.
         (3) Project location, including any compensatory mitigation site(s), by 5th field HUC and by latitude and longitude as determined from the appropriate USGS 7-minute quadrangle map.
         (4) COE contact person.
         (5) Starting and ending dates for work completed.
      ii. Other Data. Project-specific data, as appropriate for individual projects, including the following:
         (1) Pollution control. A summary of pollution and erosion control inspections, including any erosion control failure, contaminant release, and correction effort.
         (2) Fish Passage. A summary report of the ability of the culverts to pass fish post installation.
         (3) Stream Channel Functions. A summary report of the as built condition/configuration of the reconstructed channel.
         (4) Turbidity monitoring.
            (a) Monitor turbidity to insure that it does not exceed 10% over natural background turbidity, measured 100 feet upstream and downstream from in-water work
            (b) Provide copies of all turbidity monitoring reports to NOAA Fisheries.

   b. NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA Fisheries Law Enforcement at 360.418.4246. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

   c. Long Term Monitoring The applicant shall submit a report yearly for five years on stream conditions within and downstream of the reconstructed channel to ensure its functionality and that it has not caused an adverse modification of the stream below the project. In addition, the report shall address the continued ability of the new culverts to allow for fish passage.

2. To implement reasonable and prudent measure #2 (general conditions for construction), the COE shall ensure that:

   a. Minimum area. Confine construction impacts to the minimum area necessary to complete the project.
   b. Timing of in-water work. Work below the bankfull elevation[2] will be completed during the recommended in-water work window of July 15 to August 31 unless otherwise approved in writing by NOAA Fisheries.
   c. Cessation of work. Cease project operations under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.
   d. Fish screens. Have a fish screen installed, operated and maintained according to NOAA Fisheries' fish screen criteria[3] on each water intake used for project construction, including pumps used to isolate an in-water work area. Screens for water diversions or intakes that will be used for irrigation, municipal or industrial purposes, or any use besides project construction are not authorized.
   e. Fish passage. Provide passage for any adult or juvenile salmonid species present in the project area during construction, unless otherwise approved in writing by NOAA Fisheries, and after construction for the life of the project. Upstream passage is not required during construction if it did not previously exist.
   f. Pollution and Erosion Control Plan. Prepare and carry out a pollution and erosion control plan to prevent pollution caused by surveying or construction operations. The plan must be available for inspection on request by COE or NOAA Fisheries.
      i. Plan Contents. The pollution and erosion control plan will contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.
         (1) The name and address of the party(s) responsible for accomplishment of the pollution and erosion control plan.
         (2) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, drilling sites, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations, staging areas, and roads being decommissioned.
         (3) Practices to confine, remove and dispose of excess concrete, cement, grout, and other mortars or bonding agents, including measures for washout facilities.

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[2] 'Bankfull elevation' means the bank height inundated by a 1.5 to 2-year average recurrence interval and may be estimated by morphological features such average bank height, scour lines and vegetation limits.

[3] National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

(4) A description of any regulated or hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

(5) A spill containment and control plan with notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

(6) Practices to prevent construction debris from dropping into any stream or waterbody, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

ii. Inspection of erosion controls. During construction, monitor instream turbidity and inspect all erosion controls daily during the rainy season and weekly during the dry season, or more often as necessary, to ensure the erosion controls are working adequately.[4]

(1) If monitoring or inspection shows that the erosion controls are ineffective, mobilize work crews immediately to make repairs, install replacements, or install additional controls as necessary.

(2) Remove sediment from erosion controls once it has reached 1/3 of the exposed height of the control.

g. Construction discharge water. Treat all discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) as follows.

i. Water quality. Design, build and maintain facilities to collect and treat all construction discharge water, including any contaminated water produced by drilling, using the best available technology applicable to site conditions. Provide treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present.

ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities may not exceed 4 feet per second, and the maximum size of any aperture may not exceed one inch.

iii. Pollutants. Do not allow pollutants including green concrete, contaminated water, silt, welding slag, sandblasting abrasive, or grout cured less than 24 hours to contact any wetland or the 2-year floodplain.

h. Pre-construction activity. Complete the following actions before significant[5] alteration of the project area.

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[4] 'Working adequately' means that project activities do not increase ambient stream turbidity by more than 10% above background 100 feet below the discharge, when measured relative to a control point immediately upstream of the turbidity causing activity.

[5] 'Significant' means an effect can be meaningfully measured, detected or evaluated.

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite.

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[6]).

(2) An oil-absorbing, floating boom whenever surface water is present.

iii. Temporary erosion controls. All temporary erosion controls will be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

i. Temporary access roads. All temporary access roads will be constructed as follows.

i. Existing ways. Use existing roadways, travel paths, and drilling pads whenever possible, unless construction of a new way or drilling pad would result in less habitat take. When feasible, eliminate the need for an access road by walking a tracked drill or spider hoe to a survey site, or lower drilling equipment to a survey site using a crane.

ii. Steep slopes. Temporary roads or drilling pads built mid-slope or on slopes steeper than 30% are not authorized.

iii. Minimizing soil disturbance and compaction. Minimize soil disturbance and compaction whenever a new temporary road or drill pad is necessary within 150 feet[7] of a stream, waterbody or wetland by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved in writing by NOAA Fisheries.

iv. Temporary stream crossings.

(1) Minimize the number of temporary stream crossings.

(2) Design temporary road crossings as follows.

(a) Survey and map any potential spawning habitat within 300 feet downstream from a proposed crossing.

(b) Do not place a stream crossing at known or suspected spawning areas, or within 300 feet upstream of such areas if spawning areas may be affected.

(c) Design the crossing to provide for foreseeable risks (*e.g.*, flooding and associated bedload and debris, to prevent the

[6] When available, certified weed-free straw or hay bales will be used to prevent introduction of noxious weeds.

[7] Distances from a stream or waterbody are measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. 'Channel migration zone' means the area defined by the lateral extent of likely movement along a stream reach as shown by evidence of active stream channel movement over the past 100 years (e.g., alluvial fans or floodplains formed where the channel gradient decreases, the valley abruptly widens, or at the confluence of larger streams).

diversion of stream flow out of the channel and down the road if the crossing fails).

(d) Vehicles and machinery will cross riparian areas and streams at right angles to the main channel wherever possible.

v. Obliteration. When the project is complete, obliterate all temporary access roads that will not be in footprint of a new bridge or other permanent structure, stabilize the soil, and revegetate the site. Abandon and restore temporary roads in wet or flooded areas by the end of the in-water work period.

j. Heavy Equipment. Restrict use of heavy equipment as follows:

i. Choice of equipment. When heavy equipment will be used, the equipment selected will have the least adverse effects on the environment (*e.g.*, minimally sized, low ground pressure equipment).

ii. Vehicle and material staging. Store construction materials, and fuel, operate, maintain and store vehicles as follows.

(1) To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on-site.

(2) Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage in a vehicle staging area placed 150 feet or more from any stream, waterbody or wetland, unless otherwise approved in writing by NOAA Fisheries.

(3) Inspect all vehicles operated within 150 feet of any stream, waterbody or wetland daily for fluid leaks before leaving the vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document inspections in a record that is available for review on request by COE or NOAA Fisheries.

(4) Before operations begin and as often as necessary during operation, steam clean all equipment that will be used below bankfull elevation until all visible external oil, grease, mud, and other visible contaminates are removed.

(5) Diaper all stationary power equipment (*e.g.*, generators, cranes, stationary drilling equipment) operated within 150 feet of any stream, waterbody or wetland to prevent leaks, unless suitable containment is provided to prevent potential spills from entering any stream or waterbody.

k. Site preparation. Conserve native materials for site restoration.

i. If possible, leave native materials where they are found.

ii. If materials are moved, damaged or destroyed, replace them with a functional equivalent during site restoration.

iii. Stockpile any large wood[8], native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.

l. Isolation of in-water work area. If adult or juvenile fish are reasonably certain to be present, or if the work area is 300 feet upstream of spawning habitats, completely isolate the work area from the active flowing stream using inflatable bags, sandbags, sheet pilings, or similar materials, unless otherwise approved in writing by NOAA Fisheries.

m. Capture and release. Before and intermittently during pumping to isolate an in-water work area, attempt to capture and release fish from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury.

i. The entire capture and release operation must be conducted or supervised by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish.

ii. Do not use electrofishing if water temperatures exceed 18ºC.

iii. If electrofishing equipment is used to capture fish, comply with NOAA Fisheries' electrofishing guidelines.[9]

iv. Handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.

v. Transport fish in aerated buckets or tanks.

vi. Release fish into a safe release site as quickly as possible, and as near as possible to capture sites.

vii. Do not transfer ESA-listed fish to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.

viii. Obtain all other Federal, state, and local permits necessary to conduct the capture and release activity.

ix. Allow NOAA Fisheries or its designated representative to accompany the capture team during the capture and release activity, and to inspect the team's capture and release records and facilities.

n. Earthwork. Complete earthwork (including drilling, excavation, dredging, filling and compacting) as quickly as possible.

i. Drilling and sampling. If drilling, boring or jacking is used, the following conditions apply.

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[8] For purposes of this Opinion only, 'large wood' means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull channel width of the stream in which the wood occurs. See, Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

[9] National Marine Fisheries Service, *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

(1) Isolate drilling operations in wetted stream channels using a steel pile, sleeve or other appropriate isolation method to prevent drilling fluids from contacting water.

(2) If it is necessary to drill through a bridge deck, use containment measures to prevent drilling debris from entering the channel.

(3) If directional drilling is used, the drill, bore or jack hole will span the channel migration zone and any associated wetland.

(4) Sampling and directional drill recovery/recycling pits, and any associated waste or spoils will be completely isolated from surface waters, off-channel habitats and wetlands. All waste or spoils must be covered if precipitation is falling or imminent. All drilling fluids and waste will be recovered and recycled or disposed to prevent entry into flowing water.

(5) If a drill boring conductor breaks and drilling fluid or waste is visible in water or a wetland, all drilling activity will cease pending written approval from NOAA Fisheries to resume drilling.

ii. Site stabilization. Stabilize all disturbed areas, including obliteration of temporary roads, following any break in work unless construction will resume within four days.

iii. Source of materials. Obtain boulders, rock, woody materials and other natural construction materials used for the project outside the riparian area.

o. Site restoration. Prepare and carry out a site restoration plan as necessary to ensure that all streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows. Make the written plan available for inspection on request by the COE or NOAA Fisheries.

i. General considerations.

(1) Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (*e.g.*, large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

(2) Streambank shaping. Restore damaged streambanks to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation, unless precluded by pre-project conditions (*e.g.*, a natural rock wall).

(3) Revegetation. Replant each area requiring revegetation before the first April 15 following construction. Use a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs and trees. Noxious or invasive species may not be used.

(4) Pesticides. Take of ESA-listed species caused by any aspect of pesticide use is not included in the exemption to the ESA take prohibitions provided by this incidental take statement. Pesticide

use must be evaluated in an individual consultation, although mechanical or other methods may be used to control weeds and unwanted vegetation.

(5) Fertilizer. Do not apply surface fertilizer within 50 feet of any stream channel.

(6) Fencing. Install fencing as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

ii. Plan contents. Include each of the following elements.

(1) Responsible party. The name and address of the party(s) responsible for meeting each component of the site restoration requirements, including providing and managing any financial assurances and monitoring necessary to ensure restoration success.

(2) Baseline information. This information may be obtained from existing sources (*e.g.*, land use plans, watershed analyses, subbasin plans), where available.

(a) A functional assessment of adverse effects, *i.e.*, the location, extent and function of the riparian and aquatic resources that will be adversely affected by construction and operation of the project.

(b) The location and extent of resources surrounding the restoration site, including historic and existing conditions.

(3) Goals and objectives. Restoration goals and objectives that describe the extent of site restoration necessary to offset adverse effects of the project, by aquatic resource type.

(4) Performance standards. Use these standards to help design the plan and to assess whether the restoration goal is met. While no single criterion is sufficient to measure success, the intent is that these features should be present within reasonable limits of natural and management variation.

(a) Bare soil spaces are small and well dispersed.

(b) Soil movement, such as active rills or gullies and soil deposition around plants or in small basins, is absent or slight and local.

(c) If areas with past erosion are present, they are completely stabilized and healed.

(d) Plant litter is well distributed and effective in protecting the soil with few or no litter dams present.

(e) Native woody and herbaceous vegetation, and germination microsites, are present and well distributed across the site.

(f) Vegetation structure is resulting in rooting throughout the available soil profile.

(g) Plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy and dominant over undesired competing vegetation.

(h) High impact conditions confined to small areas necessary access or other special management situations.

(i) Streambanks have less than 5% exposed soils with margins anchored by deeply rooted vegetation or coarse-grained alluvial debris.

(j) Few upland plants are in valley bottom locations, and a continuous corridor of shrubs and trees provide shade for the entire streambank.

(5) Work plan. Develop a work plan with sufficient detail to include a description of the following elements, as applicable.

(a) Boundaries for the restoration area.

(b) Restoration methods, timing, and sequence.

(c) Water supply source, if necessary.

(d) Woody native vegetation appropriate to the restoration site.[10] This must be a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs and trees. This may include allowances for natural regeneration from an existing seed bank or planting.

(e) A plan to control exotic invasive vegetation.

(f) Elevation(s) and slope(s) of the restoration area to ensure they conform with required elevation and hydrologic requirements of target plant species.

(g) Geomorphology and habitat features of stream or other open water.

(h) Site management and maintenance requirements.

(6) Five-year monitoring and maintenance plan.

(a) A schedule to visit the restoration site annually for 5 years or longer as necessary to confirm that the performance standards are achieved. Despite the initial 5-year planning period, site visits and monitoring will continue from year-to-year until the COE certifies that site restoration performance standards have been met.

(b) During each visit, inspect for and correct any factors that may prevent attainment of performance standards (*e.g.*, low plant survival, invasive species, wildlife damage, drought).

(c) Keep a written record to document the date of each visit, site conditions and any corrective actions taken.

[10] Use references sites to select vegetation for the mitigation site whenever feasible. Historic reconstruction, vegetation models, or other ecologically-based methods may also be used as appropriate.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance essential fish habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).

- NOAA Fisheries must provide conservation recommendations for any Federal or state action that would adversely affect EFH (§305(b)(4)(A)).

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10), and "adverse effect" means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

3.2 Identification of EFH

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. Designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km) (PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border (PFMC 1999).

Detailed descriptions and identifications of EFH are contained in the fishery management plans for groundfish (PFMC 1998a), coastal pelagic species (PFMC 1998b), and Pacific salmon (PFMC 1999). Casillas *et al.* (1998) provides additional detail on the groundfish EFH habitat complexes. Assessment of the potential adverse effects to these species' EFH from the proposed action is based, in part, on these descriptions and on information provided by the COE.

3.3 Proposed Actions

The proposed action and action area are detailed above in sections 1.2 and 1.3 of this Opinion. The action area includes habitats that have been designated as EFH for various life-history stages of Chinook and coho salmon.

3.4 Effects of Proposed Action

As described in detail in section 2.1.5 of this document, the proposed action will result in short-term adverse effects to a variety of habitat parameters. NOAA Fisheries believes that the proposed action will cause a minor, short-term degradation of anadromous salmonid habitat due to increases in turbidity. Minimization measures will be incorporated into the construction methods to reduce adverse impacts to EFH.

3.5 Conclusion

NOAA Fisheries concludes that the proposed action may adversely affect the EFH for Chinook and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. While NOAA Fisheries understands that the conservation measures described in the BA will be implemented by the COE it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. However, the terms and conditions outlined in section 2.2.3, except monitoring and the disposition of any individual fish injured or killed during dredging operations, are generally applicable to designated EFH for the species designated in section 3.3, and address these adverse effects. Consequently, NOAA Fisheries incorporates them here as EFH conservation recommendations.

3.7 Statutory Response Requirement

Pursuant to the MSA (§305(b)(4)(B)) and 50 CFR 600.920(j), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

The COE must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920(k)).

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